OCEAN GALES AND STORMS, AUGUST 1940

Vessel	Voyage		Position at time of lowest barometer		Gale began August	Time of lowest barometer August	Gale ended August	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH ATLANTIC OCEAN			° ′	° ′				*Millibars*					
Lysefjord, Nor. S. S	New Orleans	Cortes	26 00 N.	88 05 W.	4	4p, 4	4	1,009.6	NW	NW, 8	S	NW, 8	NW-W.
Connecticut, Am. S. S	Port Arthur	Norfolk	26 45 N.	88 06 W.	4	1a, 5	5	1,003.7	WNW	S, 11	S	S, 11	WNW-S.
Sun, Am. M. S	Westwego, La.	Marcus Hook	27 54 N.	87 42 W.	5	3a, 5	5	997.3	SSW	W, 5	S	S, 10	W-S.
Roanoke, Am. S. S	Port Arthur	Wilmington, N. C.	26 48 N.	88 12 W.	5	4a, 5	5	1,004.7	NW	W, 7	S	S, 10	W-S.
Virginia, Am. S. S	New York	Port Arthur	26 48 N.	87 18 W.	5	6a, 5	5	1,007.1	S	S, 8	S	S, 9	
Rhode Island, Am. M. S.	Port Arthur	New York	27 14 N.	88 48 W.	5	2p, 5	5	1,003.4	SSW	SSW, 5	SSW	SSW, 9	W-SSW.
Pygmalion, Du. M. S	New York	Carupano	19 36 N.	65 48 W.	5	5p, 5	6	1,012.5	E	E, 8	SE	E, 9	E-SE.
Dungannon, Am. S. S	Port Neches, Tex.	Claymont, Del.	27 35 N.	89 50 W.	5	6p, 5	6	1,005.8	NE	WNW, 7	SSE	S, 10	NW-WSW.
Meton, Am. S. S	Houston	Fall River	27 30 N.	90 24 W.	5	7p, 5	6	1,005.4	N	WNW, 7	SSE	S, 10	N-WSW.
Seatrain Havana, Am. S. S.	Habana	New Orleans	28 44 N.	88 37 W.	5	4a, 6	6	1,008.5	WSW	SE, 9	S	SE, 9	SSW-SE-SSE.
Gulfqueen, Am. S. S	Wilmington, N. C.	Port Arthur	28 00 N.	90 12 W.	5	7p, 6	7	1,009.8	S	SE, 8	SE	SE, 10	None.
Amazone, Du. S. S	New York	Port au Prince	22 30 N.	74 24 W.	6	4a, 7	7	1,010.0	ENE	W, 1	WSW	ENE, 7	N-WSW.
Louisiana, Am. M. S	Providence	Port Arthur	29 00 N.	93 30 W.	6	11p, 7	7	1,004.1	SSW	SE, 4	S	SSE, 9	S-SE-SSW.
Seatrain Texas, Am. S. S.	New York	Texas City, Tex.	28 00 N.	93 30 W.	7	4a, 8	8	1,005.4	SSE	S, 8	S	S, 8	SSE-S.
Flora, Du. S. S	Curacao	New York	26 12 N.	74 06 W.	5	9a, 8	8	1,010.7	NE	ENE, 9	ENE	ENE, 9	None.
Mexican, Am. S. S	New York	Cristobal	30 50 N.	73 50 W.	8	4a, 9	10	1,008.1	ESE	SSE, 6	SW	SW, 8	SE-S.
Dungannon, Am. S. S	Port Neches, Tex.	Claymont, Del.	31 48 N.	78 12 W.	10	1a, 10	10	1,013.5		NE, 5		E, 8	NNE-E.
Meton, Am. S. S	Houston	Fall River	32 12 N.	77 42 W.	9	4a, 10	10	1,009.5	N	E, 8	ESE	E, 8	NE-E-ENE.
Maine, Am. S. S	Norfolk	Cristobal	32 00 N.	77 18 W.	10	6p, 10	11	1,005.1	E	ESE, 11	SE	ESE, 12	E-SE.
Bidwell, Am. M. S	Marcus Hook	Port Arthur	[1] 30 39 N.	77 02 W.	10	8p, 10	11	1,006.1	E	E, 8	SE	SE, 9	E-SE.
Jolee, Am. S. S	Norfolk	Houston	31 00 N.	77 00 W.	9	11p, 10	11	999.3	E	E, 10	SE	E, 10	E-ESE.
Tydolgas, Am. S S	New Orleans	New York	32 17 N.	78 29 W.	10	2a, 11	12	993.2	N	ENE, 10	SE	ESE, 12	NE-ESE.
Gulfcrest, Am. M. S	New York	Port Arthur	30 48 N.	80 30 W.	11	7a, 11	11	1,003.7		WNW, 8		WNW, 8	NW-W.
Alamo, Am. S. S	Tampa	New York	31 40 N.	77 56 W.	10	8a, 11	11	1,001.0	NW	SW, 9	SE	S, 10	NW-S.
Monterey, Am. S. S	Habana	do	31 35 N.	79 00 W.	11	9p, 11	12	1,008.1	SW	SSE, 8	SE	SSE, 9	SW-SSE.
Cayuga, U. S. C. G	On station	No. 1	39 00 N.	58 30 W.	15	8a, 15	15	1,010.2	SW	SW, 8	NNW	SW, 8	SW-N.
Steel Traveler, AM. S. S.	Cristobal	Boston	39 42 N.	69 48 W.	18	7a, 19	18	1,008.8	S	SSE, 5	SE	SE, 9	
Champlain, U. S. C. G	On station	No. 1	39 00 N.	58 48 W.	26	2a, 27	27	1,002.4	NE	SW, 9	N	SW, 10	NE-SW-WSW.
Gulfhawk, Am. M. S	New York	Las Piedras	32 20 N.	71 15 W.	30	10p, 30	31	1,009.5	ESE	ESE, 8	SE	ESE, 9	ESE-SE.
Kailua, Am. S. S	Cristobal	New York	32 45 N.	74 13 W.	31	1p, 31	31	999.0	NNW	NW, 9	W	NW, 9	NNW-W.
NORTH PACIFIC OCEAN													
Agwidale, Am. S. S	Honolulu	Balboa	15 29 N.	109 25 W.	3	2p, 3	3	[2] 1,008.5	NE	E, 7	E	E, 7	
Liberator, Am. S. S	do	do	15 38 N.	113 00 W.	3	1a, 4	4	1,005.4	NE	ESE, 8	ESE	ESE, 8	NE-ESE.
City of Alma, Am. S. S	do	do	18 14 N.	120 08 W.	5	9p, 5	6	[2] 1,008.5	NE	NNE, 8	NE	NNE, 8	
Denali, Am. S. S	Nome	Seattle	53 54 N.	161 30 W.	5	2p, 5	5	1,002.4		SW, 8		SW, 8	
W. S. Miller, Am. S. S	El Segundo	Nagaeva, U. S. S. R.	49 42 N.	146 30 W.	9	7a, 9	9	994.9	S	W, 11	WNW	W, 11	SSW-WNW.
Michigan, Am. S. S	Balboa	Los Angeles	14 20 N.	95 00 W.	20	4a, 20	20	1,009.5	N	N, 6	NE	NNE, 7	N-NNE.

[1] Position approximate.
[2] Barometer uncorrected.

WEATHER ON THE NORTH PACIFIC OCEAN

By Willis E. Hurd

Atmospheric pressure.—Barometric conditions over the North Pacific showed some extraordinarily unusual irregularities for summer, as compared with the normal, during August 1940. These conditions were peculiarly pronounced over the Gulf of Alaska and adjacent regions, and among the lower islands of Japan.

In the Gulf of Alaska pressure was exceedingly low for the month. At Kodiak the average pressure was 1,004.4 millibars (29.66 inches), the lowest of record for the month in at least the past 15 years, which is 6.8 millibars (0.20 inch) below the August normal. Lessening minus departures extended eastward to Juneau, and southward to Tatoosh Island, and in some degree westward across the entire Aleutian region. The lowest reading at Kodiak was 984 millibars (29.06 inches), on the 27th.

At the southwestern extreme of the ocean, both Naha, in the Nansei Islands, and Titijima, in the Ogasawaras, had pressures that averaged 4.4 millibars (0.13 inch) above the normal of the month.

Most central areas of the Pacific were under the influence of high pressure, unbroken except by minor lows.

Table 1.—*Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean July 1940, at selected stations*

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Millibars	*Millibars*	*Millibars*		*Millibars*	
Point Barrow	1,010.5	−1.7	1,019	20, 22	999	29
Dutch Harbor	1,008.4	−2.8	1,024	10	995	2, 3
St. Paul	1,007.4	−1.1	1,023	10	990	5
Kodiak	1,004.4	−6.8	1,022	20	984	27
Juneau	1,012.5	−4.1	1,025	18	990	29
Tatoosh Island	1,018.6	+2.7	1,027	4	1,010	26
San Francisco	1,014.2	−1.0	1,020	19	1,010	22
Mazatlan	1,011.4	+0.9	1,016	3	1,007	17
Honolulu	1,014.9	−1.4	1,017	14	1,012	26
Midway Island	1,020.7	+2.1	1,024	6, 7, 25	1,015	27
Guam	1,009.2	−0.6	1,019	1	1,003	24
Manila	1,007.3	+0.2	1,012	5, 11	1,002	28, 29
Hong Kong						
Naha	1,009.8	+4.4	1,015	[1] 4	987	23
Titijima	1,012.2	+4.4	1,023	4	1,008	25
Petropavlovsk	1,009.6	−0.6	1,017	30	997	9

[1] And on other dates.

Note.—Data based on 1 daily observation only, except those for Juneau, Tatoosh Island, San Francisco, and Honolulu, which are based on 2 observations. Departures are computed from best available normals related to time of observations.

Extratropical cyclones and gales.—August, like the preceding July, appears to have been extraordinarily quiet over northern and central North Pacific waters. Unfor-

tunately, ships' reports were unusually few from the ocean's western half, but such as were received from that area gave no indication of winds stronger than force 6 or 7 in the extreme being experienced.

For the upper eastern half of the ocean, gales were reported on 2 days. The earlier, on the 5th, was of force 8, experienced by the American steamship *Denali*, near 54° N., 162° W. The latter, on the 9th, gave evidence of considerable local energy in connection with a cyclone over and south of the Gulf of Alaska. Between 7 and 8 a. m. of that date, the American steamer *W. S. Miller* enc ountered a west wind of force 11, lowest barometer 994.9 millibars (29.38 inches), in 49°42′ N., 146°30′ W.

Tropical cyclones.—Subjoined is a report by the Rev. Bernard F. Doucette, S. J., Weather Bureau, Manila, P. I., on three depressions and four typhoons that occurred over the Far East during the month.

In the southeastern Tropics a minor tropical cyclone with a rapid west-northwestward progression, is evidenced by the reports of the three following ships: The American steamer *Agwidale* met an east wind of force 7, with slightly depressed barometer, south of Acapulco on the 3d. On the 4th the steamship *Liberator* encountered an east-southeast gale of force 8, lowest barometer 1,005.4 millibars (29.69 inches), near 16° N., 113° W. On the 5th the steamship *City of Alma*, near 18° N., 120° W., ran into a north-northeast gale of force 8, with barometer at 1,008.5 millibars (29.78 inches), uncorrected.

On the 17th and 18th slightly disturbed conditions, with some fall in barometer, were observed off the lower Central American coast. These were followed by the report of a north-northeast wind of force 7 on the 20th south of the Gulf of Tehuantepec. The observations point to the existence of an incipient depression moving northwestward from a position in unusually low latitudes in these waters.

Fog.—Some 10 to 20 percent of days with fog was reported along the central and western parts of the northern steamship routes. This is much less than the normal occurrence for August, and undoubtedly the unusual lack of observations accounted, in some measure at least, for the apparent fog deficiency. Along the American coast fog was reported as follows: Off Washington on 5 days; off Oregon on 6 days; and off California on 14 days.

TYPHOONS AND DEPRESSIONS OVER THE FAR EAST

By Bernard F. Doucette, S. J.

[Weather Bureau, Manila, P. I.]

Depression, August 2–5, 1940.—A depression, apparently of minor importance, formed about halfway between the Philippines and the Mariana Islands. It moved along a north-northwesterly course, inclining to the north and northeast, thus passing about 150 miles northwest of the Bonins as a weak low-pressure area.

Depression, August 12–15, 1940.—A mild depression formed about 400 miles east-northeast of San Bernardino Strait, and moved west and west-northwest to the ocean regions about 300 miles east of northern Luzon where it disappeared. There was no evidence of intensification during the course of this disturbance.

Typhoon, August 13–18, 1940.—A weak depression was central about 60 miles east of Mindoro during the morning hours of August 13. This disturbance moved southwestward and westward, passing south of Mindoro and Culion Islands on its way to the China Sea. Moving west, then west-northwest, it proceeded toward Indochina, apparently a depression during these days. When about 120 miles southeast of Tourane, August 16, it was definitely a typhoon, small in area, but with pressure falling fast. The typhoon moved northwest, almost parallel to the coast, and disappeared over the Gulf of Tong King. Pressure values at coastal stations, Tourane to Vinh, were close to 750 mm. (999.9 mb.), August 16 to 18.

Typhoon, August 14–24, 1940.—As a low-pressure area east of Guam, this storm moved northwesterly, then westerly, apparently increasing to depression strength. On August 16, it became a typhoon, moving west and west-southwest for 1 day, reaching the 15th parallel of latitude. On August 17, it was threatening central Luzon, but a shift to the north-northwest placed northern Luzon in danger. The center entered northern Luzon late in the afternoon of August 18 north of Palanan, Isabela Province, passed between Tuguegarao and Aparri, Cagayan Province, and entered Balintang Channel north of Laoag, Ilocos Norte Province, August 19, moving west-northwest. Over the northern China Sea, the center moved close to and north of Pratas, threatening the locality of Hong Kong. It shifted to the west, however, the center passing very close to Gap Rock, after which the storm moved southwest to Hainan Island. A change to the west brought the center across the Gulf of Tong King and into the Continent about 60 miles south of Phulien, where it weakened. No trace of the storm could be found on the weather maps of August 25.

Barometric minima recorded at northern Luzon stations are listed as follows: Palanan, Isabela Province had 731.3 mm. (975.0 mb.) with northwest winds of force 9, at 5:30 p. m. of the 18th; Tuguegarao, Cagayan Province had 736.9 mm. (982.5 mb.), with west winds of force 7, at 11:05 p. m. of the 18th; Aparri, Cagayan Province had 733.9 mm. (978.5 mb.), with southeast winds force 7, at 3:45 a. m. of the 19th; Calayan, Babuyan Islands, had 742.93 mm. (990.5 mb.), with southeast winds of force 5, at 2 p. m. of the 19th; Laoag, Ilocos Norte Province had 742.9 mm. (990.5 mb.) with northwest winds of force 6, at 6:20 a. m. of the 19th. A few days later, after the storm had passed Hong Kong, the following message was received from the Royal Observatory at Hong Kong: "Barometric minimum Hong Kong Observatory, 29.215; Gap Rock, 29.07; center probably 28.8, maximum wind gust, 83 m. p. h."

Nine lives were lost as the typhoon crossed Luzon, most of these casualties occurring in central Luzon. The steamship *Nanyo Maru* was wrecked near Nagabungan, Pasugun, Ilocos Norte Province, the ship being totally destroyed, but the passengers and crew were rescued. The provinces of central Luzon had floods over large areas for a few days. No other reports of destruction were published.

The preceding typhoon, August 13–18, formed as the southwesterly current moved across the southern part of the China Sea to Zamboanga and Cebu, this taking place on August 10 and following days. Then the depression (for it apparently was not of typhoon strength as it crossed the China Sea) intensified when the circulation was able to draw upon the rather strong southwesterly current flowing over Thailand and southern Indochina. This process occurred while a disturbance over the Pacific was approaching the archipelago, and the same procedure, so it seems, took place over the southern Philippines. Velocities of the wind over Cebu and Zamboanga increased to values of 50 k. p. h. or more after August 16, Cebu usually being stronger than Zamboanga. A few days

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